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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,898	09/22/2006	Hiroyuki Ohno	063057	4742
38834 7590 07/29/2008 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036				
EXAMINER				
WHISENANT, ETHAN C				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/593,898

**Applicant(s)**

OHNO ET AL.

**Examiner**

Ethan Whisenant, Ph.D.

**Art Unit**

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 May 2008.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1 and 3-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 22 September 2006 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**FINAL ACTION**

1. The applicant's response (filed 07 MAY 08) to the Office Action has been entered. Following the entry of the claim amendment(s), **Claim(s) 1, 3-14** is/are pending. Rejections and/or objections not reiterated from the previous office action are hereby withdrawn. The following rejections and/or objections are either newly applied or reiterated. They constitute the complete set presently being applied to the instant application.

**35 USC § 112- 2nd Paragraph**

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**CLAIM REJECTIONS under 35 USC § 112- 2ND PARAGRAPH**

3. **Claim(s) 7-9** is/are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 7** is indefinite in that it recites the phrase "for a long term." As this phrase is a relative term, the metes and bounds of what is intended cannot be determined.

**35 USC § 102**

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that may form the basis for rejections set forth in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

or  
(d) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

**CLAIM REJECTIONS UNDER 35 USC § 102/103**

**6. Claim(s) 1, 3-6, 10-14** is/are rejected under 35 U.S.C. 102(b) as anticipated by Ohno et al. [J. of the Electrochemical Society 148(4) : E168-E170 (2001)].

**Claim 1** is drawn to a solvent for dissolving nucleic acids comprising an ionic liquid which can dissolve nucleic acids , said ionic liquid comprising at least one cation selected from a defined group which includes an imidazolium cation and an anion which is selected from a defined group which includes  $\text{BF}_4^-$ .

As argued previously, Ohno et al. teach a solvent comprising all of the limitations recited in Claim 1. See especially, Column 2 on page E168.

**Claim 3** is drawn to an embodiment of Claim 1 or 10 wherein said anion is selected from a defined the group which includes a halide ion.

Ohno et al. teach this limitation. Note that the  $\text{BF}_4^-$  is a halide anion.

**Claim 4** is drawn to an embodiment of Claim 1 or 10 wherein the ionic liquid is a neutralized ionic liquid. .

Ohno et al. teach this limitation. See Column 2 on page E168, wherein Ohno et al. teach "Ethylimidazolium tetrafluoroborate ( $\text{EtImBF}_4$ ) and 1-methylpyrazolium tetrafluoroborate ( $\text{MePBF}_4$ ) were prepared by neutralization of N-ethylimidazole (2.0 g) and N-methylpyrazole (1.0 g), respectfully, with  $\text{HBF}_4$  (4.3 or 2.5 g, respectively) in water".

**Claim 5** is drawn to an embodiment of Claim 1 or 10 wherein the said solvent is adapted to perserve nucleic acids or to react nucleic acids.

Admittedly, Ohno et al. do not explicitly teach this limitation however, this limitation is, in the examiners opinion, inherent to the  $\text{EtImBF}_4$  disclosed by Ohno et al. Note Especially Figure 2. If the ionic liquids of Ohno et al. did not preserve the nucleic

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acids therein then the conductive films would show essentially the same ionic conductivity as the pure ionic liquids without DNA. See especially Figure 2.

**Claim 6** is drawn to a nucleic acid containing solution comprising nucleic acids dissolved in an ionic liquid.

Ohno et al. teach a solvent comprising all of the limitations recited in Claim 1.

**Claim 10** is drawn to an embodiment of the solvent of Claim 1 wherein the Markush group for the anion is narrowed to eliminate the recitation of  $\text{BF}_4^-$  in an attempt to overcome the prior art. However, the claim still recites a halide ion. Please note that  $\text{BF}_4^-$  is a halide ion. So Ohno et al. teaches a solvent for dissolving nucleic acids which comprises all of the limitations recited in Claim 10. As defined in Wikipedia <http://en.wikipedia.org/wiki/Halide>: a halide is a binary compound, of which one part is a halogen atom (e.g. F) and the other part is an element or radical that is less electronegative than the halogen (e.g. B). A halide ion is a halogen atom bearing a negative charge. The halide anions are fluoride ( $\text{F}^-$ ), chloride ( $\text{Cl}^-$ ), bromide ( $\text{Br}^-$ ), iodide ( $\text{I}^-$ ) and astatide ( $\text{At}^-$ ). Such ions are present in all ionic halide salts.

**Claims 11-14** drawn to a method(s) of dissolving nucleic acids.

Ohno et al. teach a method of dissolving nucleic acids which comprises all of the limitations recited in Claims 11-14 for at least the reason(s) recited above against Claims 1, 3-6 and 10. See especially Column 2 on page E168.

**RESPONSE TO APPLICANT'S AMENDMENT/ ARGUMENTS**

7. Applicant's arguments with respect to the claimed invention have been fully and carefully considered but are not deemed to be persuasive. The applicant traversed the rejection over Ohno et al arguing that : "Ohno discloses a DNA film formed from a composition comprising EtImBF<sub>4</sub>, DNA and water. Being that the DNA forms a film, it exists only in a solid state in the film. In other words, the DNA is not dissolved in EtImBF<sub>4</sub>. Rather, EtImBF<sub>4</sub> is only mixed in the DNA film in the liquid state. Thus, Applicants respectfully submit that Ohno does not disclose or suggest the solvent of claim 1. To begin, the examiner points out that the intended use of a composition does not further limit a claimed composition. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. *In re Casey* , 152 USPQ 235 (CCPA 1967); *In re Otto* , 136 USPQ 458, 459 (CCPA 1963). Regardless, Ohno et al. do teach dissolving DNA in a solvent comprising all of the limitations recited in Claim 1 during the process of forming their DNA films. See Column 2 on page E168. Accordingly it is asserted that Ohno et al.; teach each and every limitation recited in Claim 1.

**35 USC § 103**

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligations under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

#### **CLAIM REJECTIONS UNDER 35 USC § 102/103**

10. **Claim(s) 7-8** is/are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ohno et al. [J. of the Electrochemical Society 148(4) : E168-E170 (2001)].

**Claim 7** is drawn to a method of preserving nucleic acids comprising the step of preserving nucleic acids in a dissolved state within the ionic liquid for a long term.

Ohno et al. teach a method comprising all of the limitations of Claim 7 except Ohno et al. do not explicitly teach that the nucleic acid dissolved in their ionic liquid is preserved. However, this limitation is considered inherent to the ionic liquids formed by Ohno et al. See especially, Column 2 on page E168. Also note the results of Figure 2. If the nucleic acids within the ionic liquids were not preserved during the drying step(i.e. they were degraded) a signal similar to that of ionic liquid alone would have been seen.



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**Claim 8** is drawn to an embodiment of the method of preserving nucleic acids nucleic acids as recited in Claim 7 wherein said long term is 48 hours.

Ohno et al. teach this limitation wherein these authors teach drying their DNA films for 4 days (i.e. at least 48 hours).

#### **CLAIM OBJECTIONS**

**11. Claim(s) 9** is objected to as it is dependent upon a rejected independent base claim, however Claim 9 would appear to be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112 set forth in this Office action because the prior art record, if considered individually, do not teach or if considered in any combination do not reasonably suggest the method recited in Claim 9.

#### **CONCLUSION**

**12. Claim(s) 1 and 3-14** is/are rejected and/or objected to for the reason(s) set forth above.

**13.** Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL.** See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

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**14.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ethan Whisenant, Ph.D. whose telephone number is (571) 272-0754. The examiner can normally be reached Monday-Friday from 8:30AM - 5:30PM EST or any time via voice mail. If repeated attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached at (571) 272-0735.

The Central Fax number for the USPTO is (571) 273-8300. Please note that the faxing of papers must conform with the Notice to Comply published in the Official Gazette, 1096 OG 30 (November 15, 1989).

/Ethan Whisenant/  
Primary Examiner  
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